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CONDUCTIVITY CELL PROTOTYPES.(U)
MAR 81 N00014-78-C-0379
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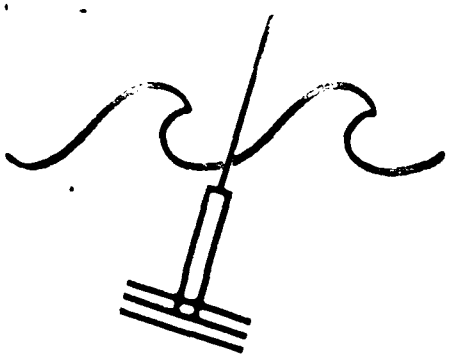

LEVEL II

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NEIL BROWN INSTRUMENT SYSTEMS, INC.
P.O. Box 498, 1140 Route 28A, Cataumet, MA 02534, USA 617 563-9317
Telex 951008 (Answer Back NBIS CATM)

24 March, 1981

AD A099914

Scientific Officer
Program Director
Ocean Technology
Ocean Science and Technology Division
Office of Naval Research
NSTL Station, Mississippi 39529

Attention: Dr. Eugene Silva

Reference: Contract No. N00014-78-C-0379

Dear Dr. Silva:

Neil Brown Instrument Systems, Inc. submits to you herewith its final report and data (your item no. 0002 of the above-referenced contract) in accordance with Exhibit A (DD Form 1423).

In conjunction with same, we submit as a first and final shipment under this contract our DD 250 form shipment no. NBI0001Z.

Yours sincerely,

Louise Mitchell
Vice President/Administration

Enclosures
LM:ny
CC: Administrative Contacting Office, Boston
Director, Naval Research Laboratory, Washington, D.C.
Office of Naval Research, Arlington, Virginia
Defense Documentation Center, Alexandria, Virginia
Office of Naval Research Branch, Boston

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NEIL BROWN INSTRUMENT SYSTEMS, INC.
P.O. Box 496, 1140 Route 28A, Cataumet, MA 02534, USA (617) 563-8917
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(11) 24 March 1981

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Scientific Officer
Program Director
Ocean Technology
Ocean Science and Technology Division
Office of Naval Research
NSTL Station, Mississippi 39529

Attention: Dr. Eugene Silva

Reference: Contract No. (15) N00014-78-C-0379

CONDUCTIVITY CELL PROTOTYPES.
(9) FINAL REPORT.

In accordance with Section F - Description/Specifications, the work and services performed in accordance with ONR Contract No. N00014-78-C-0379 are as follows.

Two laboratory test bridges that ~~utilize~~ a comparison technique between a reference cell and a cell that has been exposed to marine foulants have been completed through their test stage. 17 10-cm. conductivity cells have been constructed from the 18 sets of purchased parts which were received by NBIS, Inc. on December 18, 1979. One cell failed during the high temperature firing process, however, six months after receipt 17 successfully completed the glassing/firing process. After successfully completing the firing process, these 17 cells were sent to an industrial plating firm where the exposed electrodes received a 5-mil platinum plating. This process was used to improve the conductivity cell stability and took

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approximately eight weeks to complete. Next, a waterproof connector and cable arrangement were designed and constructed by NBIS, Inc., and mounted onto the 17 cells. All 17 conductivity cells are to be pressure-tested to 500 PSI for one hour. 12 conductivity cells were then submitted to Oceanographic Industries for Ce-Cap anti-foulant impregnation. This anti-foulant is a tributyl-tin-oxide base. The five conductivity cells which were not submitted to Oceanographic Industries were retained by NBIS, Inc. as a reference-control group. The 12 conductivity cells which were impregnated with anti-foulant have been received by NBIS, Inc. and will be held at our plant pending a new contract which we hope this year to receive from the Office of Naval Research to perform tests on same.

The conductivity cells have features that are unique unto themselves, even while they do use the 4-electrode technique of our present 3 cm. conductivity cell design. For example, the conductivity cell mechanical dimensions are unique: 1 cm. internal diameter by 10 cm. overall length. The conductivity cell electrode plate utilizes a metalization technique which has not been used in other conductivity cell designs and the conductivity cell headpiece is a porous alumina which enables it to be impregnated with anti-foulant. The design of these cells are further unique because of the special waterproof connector cables which allow the cells to be submerged for long periods of time.

The two laboratory test bridges were designed using existing Mark IIIB CTD techniques, however, no other NBIS, Inc. products utilize this balanced bridge technique.

Under contract NBIS, Inc. was to construct 20 prototype conductivity cells. Due to vendor supply problems, we were required to accept only 17 conductivity cells. NBIS, Inc. submitted a purchase order on June 19, 1979 to a vendor for 20 sets of 10 cm. conductivity cell ceramic parts. 22 sets were received by NBIS, Inc. on July 16, 1979, however, during the glazing and firing procedure, a serious design flaw was discovered and the corporation was forced to completely reorder to a new design. The new order was submitted to the same ceramic parts vendor. Consistent attempts were made to expedite our purchase order, however, the second set of 18 conductivity cells was not received from the vendor until December 18, 1979. The inability of this vendor to deliver these components in a timely manner caused considerable contractual delay. The residual four sets of ceramic parts due under this purchase order were finally received March 11, 1981. Three out of the four sets were badly damaged in shipment and thus found unacceptable.

As was stated earlier, NBIS, Inc. is retaining all completed government property (i.e., two laboratory test bridges and 17 conductivity cells, 12 of which have been impregnated with anti-foulant). This property will be retained while negotiations proceed for another contract through the Office of Naval Research. Said contract is to be negotiated for tests in the field which would be performed on the cells using both facilities at the Woods Hole Oceanographic Institution and the laboratory test bridges completed under N00014-78-C-0379.


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